EXECUTIVE SUMMARY
CID BOREALIS 2002

OPERATIONAL ANALYSIS SUMMARY

1. A summary of the combined observations as they relate to the ABCA Program Goals, ***"Enhance Coalition Effectiveness*, *Prepare for the Future*, and *Enhance Program Management"*** are as follows:

   a. Albeit the status quo for the last decade, CID BOREALIS 2002 demonstrated that the coalition has adequate interoperability to exercise authority and direction over assigned or attached forces via radio. This baseline capability demonstrates that the coalition would be able to coordinate and synchronize maneuver units and staff activities, and assess the current situation at a basic level;

   b. As the coalition moves toward a more digital based force, and interoperability issues are solved, the quality and quantity of perishable information should improve; consequently, improving the CIS and the ability to exercise command and control to a higher standard. A balance of technological and liaison solutions need to be maintained to ensure that an ABCA Coalition command and control system can maintain SA through a redundant means. The dependence on digital devices to provide information will increase as reliability increases, which increases the risk that no one will have or still use analogue systems to fall back on in the event of a digital failure, Cyber, or Electronic Warfare (EW) attack.

   c. CID BOREALIS 2002 demonstrated the need to standardize equipment specifications, as well as, procedures and doctrine to address the process and methods for providing accurate, timely, and relevant information distribution between coalition partners in most operational spectrums. While Nations can send formal military messages within their own tactical CIS architecture, the incompatibility between national applications hinders timely distribution of information, thereby potentially decreasing their ability to achieve timely SA. The severity of which is dependant on the level of command and the operational tempo. Workarounds, software, or emerging technologies may facilitate interoperability of these systems in the future. However, establishing technical interoperability between systems does not guarantee the full capability of feature sets, which certain staffs may require to conduct MDMP. As a result, the flexibility with which the commander can execute command and control may be limited depending on the architecture and the nations involved.

   d. The continued documentation of the standard and non-standard (work-arounds) test strings used at CID BOREALIS 2002 will enable the coalition to develop and maintain configuration management and engineering standards, as well as prepare and arrange for the necessary resources and skills to replicate similar activities in the future. This will also serve to assist in the planning and conduct of future coalition operations between ABCA (NZ) nations.

   e. Emerging technologies are likely to change the nature of coalition operations through the use of contractors on the battlefield, greater need for information management, information filters, and real-time lateral collaborative planning. MGI/GIS data, wireless communications, software gateways to connect C2IS COTS with national battle-command systems, and the proliferation of COTS products to the lower echelon

units are the emerging technologies most likely to impact future coalition operations. The major implications of the increased reliance on contractors is the physical risk to contractors and associated legal ramifications, and the risk of losing corporate knowledge. The reliance on contractor support may be translated as a loss in flexibility or self-sufficiency as there could be a loss in the ability to address problem and make the necessary repairs in a field environment.

RECOMMENDATIONS

2. It is recommended that:

   a. The ABCA Program place emphasis on Interoperability/Future Standards Development;

   b. The ABCA Program place emphasis on future initiatives relating to operational, and technical interoperability;

   c. The ABCA Program place emphasis on ensuring a level of "interoperability of the mind" is maintained and developed such that the Armies are able to predict how each other army will react to the same piece of information;

   d. The ABCA Program place emphasis on developing common levels of interoperability, in parallel with development of common standards;

   e. The ABCA Program place emphasis on accommodating both current and future technologies in standardization initiatives; and

The ABCA Program develop a "Way Ahead" for CIS Interoperability in the ABCA Program as outlined in this summary.

TECHNICAL REPORT SUMMARY

INTRODUCTION

1. (U) The aim of Coalition Interoperability Demonstration (CID) BOREALIS was to test Communication Information System (CIS) interoperability among the ABCA (NZ) Armies in order to better prepare and enable American, British, Canadian, Australian (ABCA) and New Zealand (NZ) to operate together in support of coalition tactical operations.

PLANNING

2. (U) A number of imperatives guided the demonstration including:

   a. Discovery of failure is good. As with other types of equipment testing the discovery of a failure is considered a success, as it provides the basis for improvement. Therefore, testing was planned to discover failures, as an essential part of determining the level of interoperability.

   b. Use Current Equipment. Equipment brought to CID Borealis reflected what was currently available within the inventory of tactical signal units at the Brigade and Divisional level.

OPERATIONAL CAPABILITIES DEMONSTRATED

3. (U) CID Borealis designated three information service categories. They were:

a. Combat Net Radio (CNR) Services - VHF, HF and UHF technologies;

b. Network Services – this represented network connectivity capability via multiplexed voice and data channel capacity over Wide Area Network (WAN), switch, and transmission technologies, required as a backbone for user services; and

c. User Services – this represented features such as voice services and information system applications (Email, Military Messaging, Topographical data, etc) that are dependent upon network services for connectivity and utilise computer and Local Area Network (LAN) technologies.

SUMMARY OF RESULTS

4. (U) The interoperability status of each interface is assigned a grade of *GREEN, AMBER*, or *RED* according to the test criteria listed in Table 1.

GREEN	Interoperable: Achieved full functionality with no configuration changes.
AMBER	Interoperable, but with limitations: Achieved partial functionality or required a configuration change to achieve at least minimum functionality
RED	Not Interoperable

Table 1 CID Borealis Test Criteria (General)

5. (U) A more detailed accounting indicates that Combat Net Radio (CNR) was green for test results associated with VHF, HF and UHF voice. Network Services were considered yellow for transmission, red for multiplexer, red for digital switch trunking and red for wide area network connectivity. User Services were yellow for commercial email, green for file transfer, red for military format messages, red for database update/exchange, green for voice switch features and green for commercial local area network.

Combat Net Radio	VHF-Green HF -Green UHF -Green
Network Services	Transmission –Yellow Multiplexer –Red Switch (Trunking) –Red WAN –Red
User Services	Email Clients/Servers- Yellow File Transfer - Green Military Format Messages- Red Database Update/Exchange– Red Switch (Features) –Green LAN –Green

6. (U) The attached report examines in more detail the interoperability results. The interoperability results reported include aspects of technology, unit level skills, operational planning and general readiness issues.

LACK OF PERCEIVED OPERATIONAL IMPACT OFTEN HIDES INTEROPERABILITY CONCERNS

7. (U) Many of these interoperability problems have operational workarounds, especially where one nation is capable of providing the higher to lower CIS resources to the coalition partners, which is often the case in theatre. However even these workarounds require connectivity at some point via gateways and hence does not take away from the importance of member nations addressing critical issues on a bilateral basis, where minimal resources can provide superior improvements in interoperability.

INTEROPERABILITY GUIDE

8. (U) There were 696 tests identified of which 346 demonstrated an ability to interoperate. All results were captured for signals planning staff in an Interoperability Guide (IG) that will be issued by the US Joint Interoperability Test Command (JITC) that is on contract to the ABCA Program Office.

FUTURE WORK

9. (U) As a result of CID Borealis the ABCA Interoperability Engineering group (SWP/IE) will be addressing future work items for the US 2004 Exercise, intended to prioritise and close the capability gap on some of the more critical and common interoperability problems.

10. (U) In addition every ABCA (NZ) member nation is encouraged to focus resources on specific bilateral interoperability problems, to further assist in closing specific capability gaps.

CONCLUSIONS

11. (U) CID Borealis was a major success. This was the first time that the ABCA (NZ) armies actually had conducted an interoperability demonstration to validate communication

information systems interoperability. The results were conclusive that we have major issues that need to be addressed if we plan to support the war fighter effectively, in coalition operations.